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Über neue Amphibien des Königl. Zoologischen Museums (*Euprepes, Acontias, Typhlops, Zamenis, Spilotes, Œdipus.*) By W. Peters. 8vo. pp. 773–779, pl. I. (Extr. Monatsb. d. Königl. Akad. d. Wissenschaften zu Berlin. Aug. 1879.) From the author.

Über die Amphisbænen und eine zu denselben gehörige neue Art. (Lepidosternon Wuchereri.) By W. Peters. 8vo. pp. 273–277, pl. I. (Extr. Monatsb. de Königl. Akad. d. Wissenschaften zu Berlin, März, 1879. From the author.

Über die von Hrn. Dr. G. A. Fischer in Ost afrika, von Mombas bis in das Pokômo-Land und das südliche Galla Land, unternommenen Reise eingesammelten Säugethiere. By W. Peters. 8vo. pp. 829–832. (Extr. Monatsb. d. Königl. Akad. d. Wiss. zu Berlin, Oct. 1879.) From the author.

Embryogénie de l'Asteriscus verruculatus. Par le Dr. J. Barrois. 8vo. pp. 8, pls. II. (Extr. de Journ. de l'Anat. et de Physiologie.) Paris. From the author.

Recherches sur le Developpement des Araignées. (Communication preliminaire.) Par le Dr. J. Barrois. 8vo. pp. 529–547, pl. I. (Extr. de Journ. de l'Anat. et de Physiologie.) Paris. From the author.

Sur quelques espèces nouvelles au peu connues du terrain crétacé du Nord de la France. Par Charles Barrois. 8vo. pp. 449–457, pls. III. (Extr. des Ann. de la Soc. Geol. du Nord. T. IV. 1876.) From the author.

Sur l'éntendue du Système tertiare inferieur dans les Ardennes et sur les argiles a Silex. Par Dr. Chas. Barrois. 8vo. pp. 340-376. (Extr. des Ann. de la Soc. Geol. du Nord. T. VI, 1879.) From the author.

Le Marbre griotte des Pyrénées. Par le Dr. Charles Barrois. 8vo. pp. 270–300. (Extr. des Ann. de la Soc. Géol. du Nord. Tom. VI, 1879.) From the author.

Catalogue of the Pacific Coast Fungi. (Published under the direction of the California Academy of Sciences.) By H. W. Harkness, M.D., and Justin P. Moore, A.M. 8vo. pp. 46. From the author.

Prodrome des Plesiosauriens et des Élasmosauriens des Formations Jurassiques Supérieures de Boulogne-sur-Mer. Par M. H-E. Sauvage. 8vo. pp. 38, pls. II. (Extr. from Ann. des Sciences Naturelles 6é Série. T. VIII.) From the author.

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GENERAL NOTES.

BOTANY.

FERTILIZATION OF FLOWERS BY HUMMING-BIRDS.—Prof. Beale's note under the above title in the NATURALIST for February induces me to send the following observations, made in Alabama in 1879, which may be of some interest. The ruby throat was often seen to get nectar from both sets of glands at the base of the involucre about cotton flowers; it was constantly seen at the flowers of the low *Œnothera sinuata;* very often about those of the May-pop (*Passiflora incarnata*), the white flowered buck-eye (*Æsculus parviflora*), the wild and cultivated morning-glories, the yellow day-lily, the white oleander, several sorts of Pelargonium, the lemon, fuchsia, larkspur, malvaviscus, zinnia, "sage-bush," and "osier willow." One night just about twilight one was seen at the flowers of the gourd; and I several times saw them about the flowers of *Lobelia cardinalis*, where they usually acted much like the one spoken of in the NATURALIST for 1879, p. 431, though the flowers were by no means always visited regularly from the bottom of the raceme up. The flowers of *Erythrina herbacea* were often visited by these birds, and appear to be adapted to fertilization by them, like the "palosabre" (*Erythrina*, sp.) described by Belt.[1] The malvaviscus mentioned above does not fruit in the North where I have seen it cultivated, and experiments made a few years ago on a plant in Brooklyn showed that, in that case at least, artificial crossing between different flowers on the same plant did not lead to the production of fruit. Whether this is always the case with the plant as cultivated in the North I do not know, but it fruits abundantly in Southern Alabama, where it is perfectly hardy; and yet I could not learn that there was a plant within several miles of the one on which my observations were made, so that the crossing effected by the birds was probably between flowers of one plant. This difference may be due to the difference in climate.

The species which have been mentioned are all that are recorded in my notes, though birds were seen to visit many others, and a planter laughingly said to me one day, "You'll have to note every conspicuous flower if you want a full list of those visited by humming birds," reminding me of what Delpino says in his Ulteriori Osservazioni, P. II, Fas. II, p. 336, "According to Gould, to number all of the flowers frequented by this species would be equivalent to repeating the name of half the plants of North America."—*William Trelease.*

CARNIVOROUS HABITS OF BEES.—Apropos of the asserted killing and eating, by hive bees, of moths captured by the bladder-flower, *Physianthus*, I would like to call the attention of readers of the NATURALIST to the following statement by Kirby and Spence in their Introduction to Entomology, Letter XX, p. 384 of the seventh edition: "Though the great mass of the food of bees is collected from flowers, they do not wholly confine themselves to a vegetable diet; for, besides the honeyed secretion of the Aphides, the possession of which they will sometimes dispute with the ants,[2] upon particular occasions they will eat the eggs of the queen. They are very fond also of the fluid that oozes from the cells of the pupæ, and will suck eagerly all that is fluid in their abdomen after they are destroyed by their rivals."[3]—*Wm. Trelease.*

FUNGI AS INSECT DESTROYERS.—Two very interesting observations, bearing on one of the methods taken by nature to prevent an over-production of insects injurious to vegetation, are recorded in the introductory portion to the Thirty-first Report of the New York State Museum of Natural History: One of these is in regard to the destruction, by a fungus, of the "seventeen-year locust," which, it will be remembered, made one of its septemdecennial visitations in 1877. This fungus, which Mr. Peck de-

[1] Naturalist in Nicaragua, p. 130.

[2] Abbe Boisier, quoted in Mill's on Bees, 24.

[3] Schirach, 45. Huber, I, 479.

scribes as belonging to a genus and species new to science, and which he names *Massospora cycadina*, develops in the abdomen of the insect, and consists almost wholly of a mass of pale yellowish or clay colored spores, having the appearance to the naked eye of a lump of whitish clay. Though the insect is not killed at once by the parasite, it is manifestly incapacitated for propagation, and thence the fungus may be said to prevent, to some extent, the injury that would otherwise be inflicted upon trees by the deposition of the Cicada's eggs. While in the Adirondack region, Mr. Peck noticed the fact that the larvæ of some unknown insect, existing in countless numbers, and feeding upon the leaves of the alder, were fast threatening the destruction of this plant. Looking beneath the bushes for the pupæ of the insect in order to obtain a clue to the latter's identity, he was surprised to find that the larvæ, in every instance, had been killed by a parasitic fungus before they had had time to undergo their transformation; and he believes that by this provision of nature the alders of the abovementioned region have been saved from utter destruction, inasmuch as in another year they would have been completely defoliated by the larvæ had but half of those which he observed been allowed to come to maturity.—*Bulletin of the Torrey Botanical Club.*

TWINING PLANTS.—In the last number of THE AMERICAN NATURALIST I notice a short article in reference to "the direction of the twining of plants." I have given the subject some attention, and my observations show that the direction is sometimes variable. I know a large vine of *Celustrus scandens* that branches fifteen feet from the ground, one branch of which turns to the right, the other to the left, so that for over twenty feet they cross each other every four feet, and in two places are self-grafted together, each plant or branch bearing flower and fruit.—*J. C. Andras.*

THE GERM DISEASE THEORY.—A contribution to this subject has been made by Koch, who finds that certain species of Bacteria, the lowest forms of plant life, occur in certain forms of disease in certain species of animals, and that such animals inoculated with such Bacteria suffer from these diseases. Koch's method has been to inoculate mice or rabbits with decomposing animal matter, to notice what symptoms, if any, were the result of the operation, and to examine the tissues of the infected animal for the particular form of microphyte contained in the injected fluid. By injecting putrid blood or infusion of meat and thus artificially producing septicæmia in mice, the animals died in a few hours, but it was found that the Bacteria originally injected were still confined to the cellular tissue under the skin, and that they had not propagated themselves. It was also found that healthy animals inoculated with the blood of the dead animal were not injured by it. Here, then, the disease was evidently due not to living plants, but to a soluble poison—septin or sepsin—existing with the Bacteria in the putrid fluid. But other symptoms set in in about one-third of the cases, and it was found that one-tenth of a drop of blood from any part of an infected animal was able to communicate the disease to another. Thus Koch carried the disease through seventeen successive animals, the second being infected from the first, and so on through the entire series. An examination of the blood of any of these mice revealed multitudes of minute Bacillus-like Bacteria, of definite size and form, and evidently the contagium of this particular form of traumatic septicæmia, a disease peculiar to house mice. Beside the characteristic Bacteria, occasionally a Micrococcus-form was observed, which multiplied with great rapidity, forming characteristic chains in the subcutaneous tissue; the septicæmia-Bacillus at the same time living and increasing in the blood. When injected into a mouse's ear these micrococci produced a perfectly distinctive disease, *i. e.*, necrosis of the tissues of the ear, which were penetrated through and through, and completely destroyed by the rapid multiplication of the micrococcus plants. This and experiments on rabbits and other mice showed that infection was produced by infinitesimal as well as by large doses; the Bacterium-forms for each disease seemed thoroughly characteristic, the plants differing in size, mode of occurrence, &c., the presence of these microphytes being an indispensable requisite in the development of these symptoms. On the other hand, Dr. T. R. Lewis claims that one of the chief arguments against the germ disease theory, is the fact that a septiferous fluid retains its virulence after being boiled, filtered, evaporated, or combined with acids in the form of salts, but it is argued that this is not opposed to the action of a specific poison produced by the microphytes by a process of fermentation in the decomposing fluid.

BOTANICAL NEWS.—We glean from the *Journal* of the Royal Microscopical Society for February, the following notes:—The germination of the maize-rust (*Ustilago maydis*), which occurs in moist air in from twenty-four to forty-eight hours, has been observed by A. Renner.——The vine mildew or false Oidium which makes its appearance from time to time in vineyards in the United States, has been detected in France on stocks imported from this country. This mildew is frequently confounded with the true Oidium, but is allied to the potato disease, being caused by a nearly allied fungus (*Peronospora viticola*).——A new form of Bacillus has been found in the liver of a badger.——The spores of a number of species of Bacterium, Vibrio, Spirochæte, and especially Leuconostoc have recently been discovered by Van Tieghem. ——While Chiene and Ewart have stated that neither bacteria nor their germs exist in the healthy organs of animals, Nencki and Giacosa have ascertained by very careful experiments that they do occur in healthy animals.——The cause of the movements of bacteria has been studied by Van Tieghem; while the ultimate cause is the contractility of the protoplasm, he thinks it is immediately due to the prolongation in places of filiform structures, to which he gives the name of appendages. These, he thinks, he has demonstrated to be the cause rather than vibratile cilia protruding through the cell wall.——A series of mycological preparations for the microscope of great value in the study of minute fungi have been made for sale by Dr. Zimmermann, of Chemnitz, in Saxony, Prussia.——The prospectus is issued of a proposed *Botanisches Central-blatt*, edited by Dr. O. Uhlworm of Leipzig. It is to be a weekly publication, consisting of information, reports, and abstracts of all papers in the various branches of botanical science published in Europe or America, titles of new books, etc. (*A. W. B.*)——The advance of the British troops into Affghanistan last year has not been without some scientific results. General Robert's force was accompanied by a naturalist, Dr. Aitcheson, who made large collections of plants, principally in the Kurum valley. These have been sent home and examined at Kew, and point to the interesting fact that in this valley we have a meeting point and intermingling of three very distinct floras, those of Western Asia, of India, and of Thibet.—(*A. W. B.*)

ZOÖLOGY.[1]

NOTES ON CALIFORNIA FISHES.—*Salmonidæ.*—Among the Salmonidæ that have occurred in the markets of San Francisco during September and October, the hump-back salmon, so-called from the prominent hump upon the back in advance of the first dorsal fin, has been conspicuous.

The anadromous salmon of this coast, that is, the salmon which ascend rivers to deposit their spawn but go to the sea to feed, belong to a different group from the well-known salmon of Europe and of the Atlantic coast. This latter (*Salmo salar*) is more nearly related to our brook troüts than to our salmon.

On account of the very long hooked jaw possessed by some of our Pacific salmon, they were grouped by Dr. Suckley under the generic name of *Oncorhynchus*, and by this name they are still known to naturalists. The character mentioned is not, however, the one to be relied on to distinguish these salmon, since the hooked jaws are only fully developed in the male sex after the spawning season; the females and young having straight jaws. This may be at once seen by a glance at the young *quinnat* (the common Californian salmon) now in the market. As they lie beside the old males with their excessive development of teeth and jaws, they seem a different species. The most reliable, obvious character, is the number of the anal rays, which in our

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[1] The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.